Skip the Flip and start taking the Tablets?

Summary

This document concludes that a viable electronic flip chart replacement is the digital pad. Digital pads retain the natural pen-paper interface while producing an electronic image. The electronic image can be shown as a real time protection screen display and the image can be filed for reference or distribution.

1 Introduction

At the May 2007 SPDC Working Group meetings several people tried to explain their thoughts by waving their arms in the air or gesticulating at the picture on the projector screen. What they needed, but didn't have, was a Flip Chart to illustrate their ideas on.

Flip Charts, like projector screens are very difficult to ship to meetings, consequently the hotel provides Flip Charts or White Boards at some extortionate rate.

It doesn't seem so long ago that I spent many hours printing out and mailing off draft standards in paper form in preparation for meetings. Then we became e-mail attachment enabled and drafts could be sent out that way. Today, we can post drafts on the PES SPD Forum (members' area only of course) and even post the updated draft at the meeting.

Electronic aids are now widely accepted, but we still crave the humble Flip Chart for instant expression. There are interactive White Boards that can capture the board writing electronically or as a print out. Interactive White Boards tend to large and cumbersome making them more suitable for fixed installation. The modern small-sized equivalent is some form of graphics input connected to the PC, projector and screen system. This document examines the viability of electronic flip charts. The acceptance of an electronic flip chart technology requires that the input method is intuitive and natural.

This document is not intended to be a comprehensive review and readers are encouraged to do their own evaluations on technologies and products. Suppliers and product names are used only as examples and should not be taken as specific recommendations.

The British Educational Communications and Technology Agency studies (Annex B) provided the stimulus for this document.

2 What's needed for an electronic Flip Chart?

Besides the normal PC, projector and screen we need to have matching software, software drivers and the graphics hardware (includes pen).

2.1 Drawing tablet

Drawing tablets are usually sold for artistic purposes or image editing. Consequently they have more sophisticated functions than a marker pen on a Flip chart. For example besides the straight pen function you can make the pen act as a paintbrush or an air bush. The tablets are normally pressure sensitive so you can use that to change the "brush" width or even colours. Being electronic, such tablets have an erase function.

Figure 1 shows a typical tablet hardware set; tablet, pen and mouse.

Figure 1 — Typical graphics tablet hardware

Graphics tablets have high resolution, but the effective drawing area is quite small ranging from 25 % of the overall size for an A6 area to 50 % of the overall size for an A4 wide drawing area. The tablets are heavy too see Figure 2. For a drawing area that is the size of US letter paper (8.5 in x 11 in) the overall tablet size will be about 12.5 in x 16 in and would weigh around 4 lb.

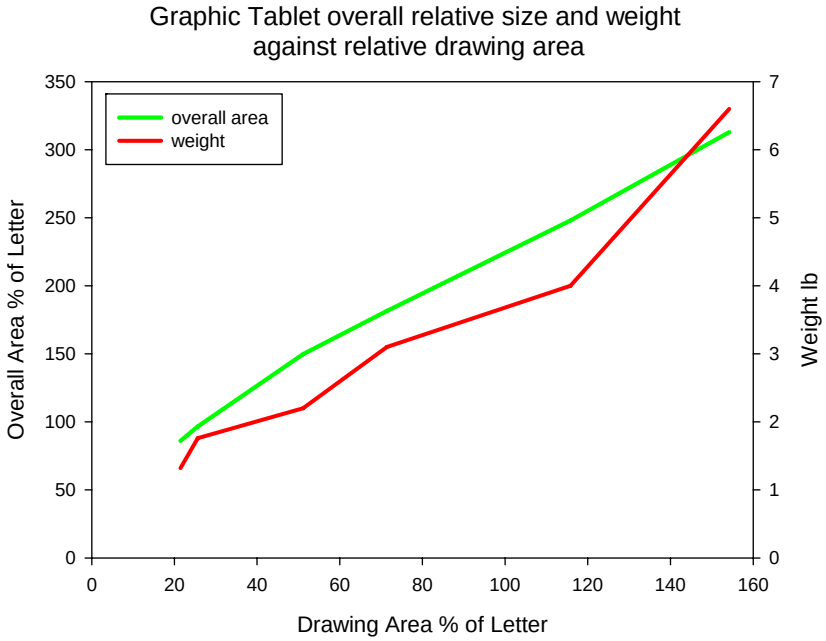

Figure 2 — Graphics tablet size and weight

Artists graphics tablets with a 4”x5” drawing area can be bought for under 100 $. Larger 6”x8” drawing area can be bought for about 200 $. The problems for unfamiliar users is the small drawing area resulting in amplified the pen movement on the screen, and the pen position coordination with the drawing as the pen position has to be judged from the PC screen.

2.2 Digital Pads (Interactive paper)

Many people prefer pen on paper input because it is natural and what they are used to. Paper is easy to navigate, people see the result and it can be further annotated. A digital pad uses a standard paper pad, mounted on an electronic sensor panel and a special pen. The pen takes standard ink refills and has a small transmitter sensed by the panel to electronically record the writing in memory. An example of digital pad is the AceCad Digimemo (http://www.acecad.com.tw/dma502.html) see Figure 3. The cost for a letter sized digital pad

is around 150 $. Connected to a PC the recordings can be viewed, edited or shared possibly with the meeting record.

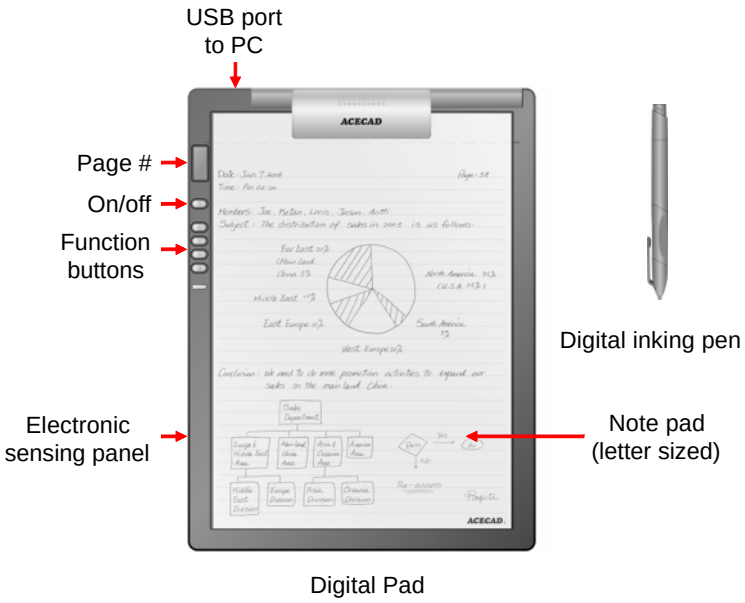

Figure 3 — ACECAD DigiMemo

2.3 Digital pens

These pens write normally on paper and use electronic position sensing. In the case of the Anoto pen [http://www.anoto.com/filearchive/2/2853/Anoto%20technology.mpg] the infrared sensed position is sent to the computer by a Bluetooth link. Currently this type of solution appears to be a custom offering rather than for the mass market. Other electronic pen solutions require special paper.

2.4 Tablet PC

A Tablet PC is a lightweight computer, which allows the user handwrite notes, enter data and navigate by touching the screen using a digitiser pen on the screen. Most tablet PCs have handwriting recognition.

Tablet PCs make good flip chart replacements, but are not a natural input method for some, are bulky and too expensive.

3 Recommendation

For the reasons given in clause 2, the most appropriate graphical input device is the digital pad as it uses a conventional pen and paper approach, whilst giving electronic capture. The resolution and drawing capabilities of the digital pad aren't as good as a graphic tablet, but flip charts aren't used for precision drawing either.

In the US, letter sized digital pads are available as the ACECAD DigiMemo L2, Adesso Cyberpad 8.5X11 and SolidTek DM-L2 DigiMemo L2. These digital pads can be bought from various Web suppliers e.g. Amazon. An 8-1/2-by-11-Inch Digital Pad in a protective folder can currently be bought for under 200 $. The smaller sized 6-by-9-Inch Digital Pad in a protective folder can be bought for under 140 $.

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Annex A
Notes on using a digital pad

A.1 Introduction

Besides the normal paper and pen function, digital pads generally have two software modes. The first mode is stand alone when the digital pad is not connected to a PC. The second mode is when the digital pad is connected to a PC and it becomes a digital tablet device. The examples given here are using the ACECAD DigiMemo L2.

A.2 Stand alone operation

In this mode, the digital pad is powered by its internal batteries. When the digital pad is powered on, the display shows the digital pad status, see Figure A1. The display shows the page number [1], a page picture (filled with dashes if it contains electronic writing), that there is an SD memory card fitted [SD], the time and battery condition.

Figure A1 — Stand alone display

Electronic (recorded) writing is shown to be happening by the appearance of a pen in the display, see Figure A2.

Figure A2 — Electronic writing shows pen symbol

A.3 PC connected operation

Connecting the digital pad to a PC USB socket overrides the stand alone operation. The USB connection powers the digital pad and the display shows –U-, see Figure A3. The PC sees the digital pad memory (internal and memory card) as extra removable storage discs.

Figure A3 — USB connected display

In stand alone operation the paper pad is used in portrait orientation. The digital pad software (clause A.3.1) also uses the paper pad in the portrait mode.

All other PC software sees the digital pad as a landscape USB tablet. Thus it becomes necessary to use the paper pad in a landscape mode by turning the pad through 90 degrees. A quadrille ruled paper pad makes it easier to write and draw in both portrait and landscape orientations as there are horizontal lines in both orientations.

A.3.1 Digital pad software
http://acecad.com.tw/digimemo-dl.html

The ACECAD Digimemo Manager v2.30L software is a 5.4 MB file, last updated in July 2007. Digital pages stored in the digital pad memory can be imported, annotated and saved as an ACECAD e-book file, a BMP, GIF, PNG, TIF or PDF file see Figure A4.

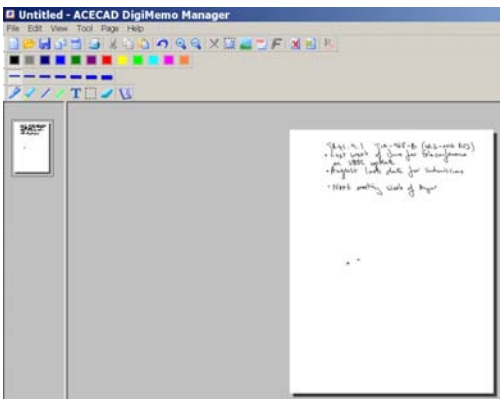

Figure A4 — Digital page imported from digital pad memory

The top toolbars allow the selection of drawing tools, line thicknesses, colours, editing, viewing and file save functions see Figure A5.

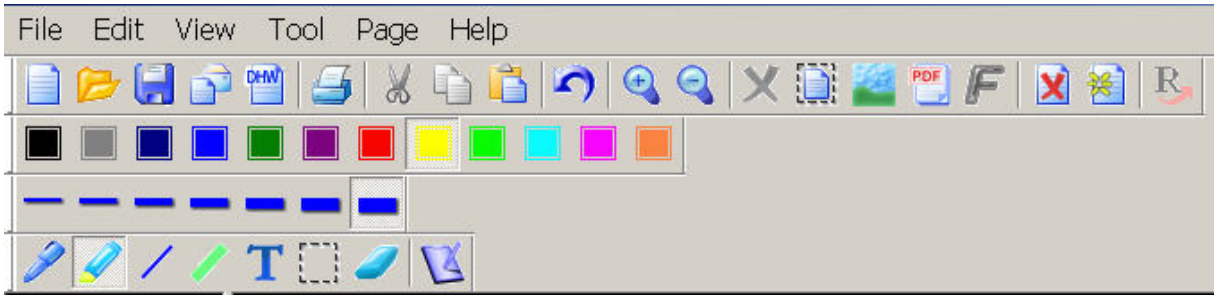

Figure A5 — Digimemo Manager Toolbars

The on-line writing mode is effectively the flip chart function and is entered by clicking the pad and pen icon at the far right of the bottom toolbar of Figure A5. Drawing on the paper also draws on the PC screen in real time, see Figure A6. The view level is automatically set to 100 %. For the screen resolution of Figure A6, about 60 % of the vertical page is shown on the screen. Scrolling is needed to see the rest of the page.

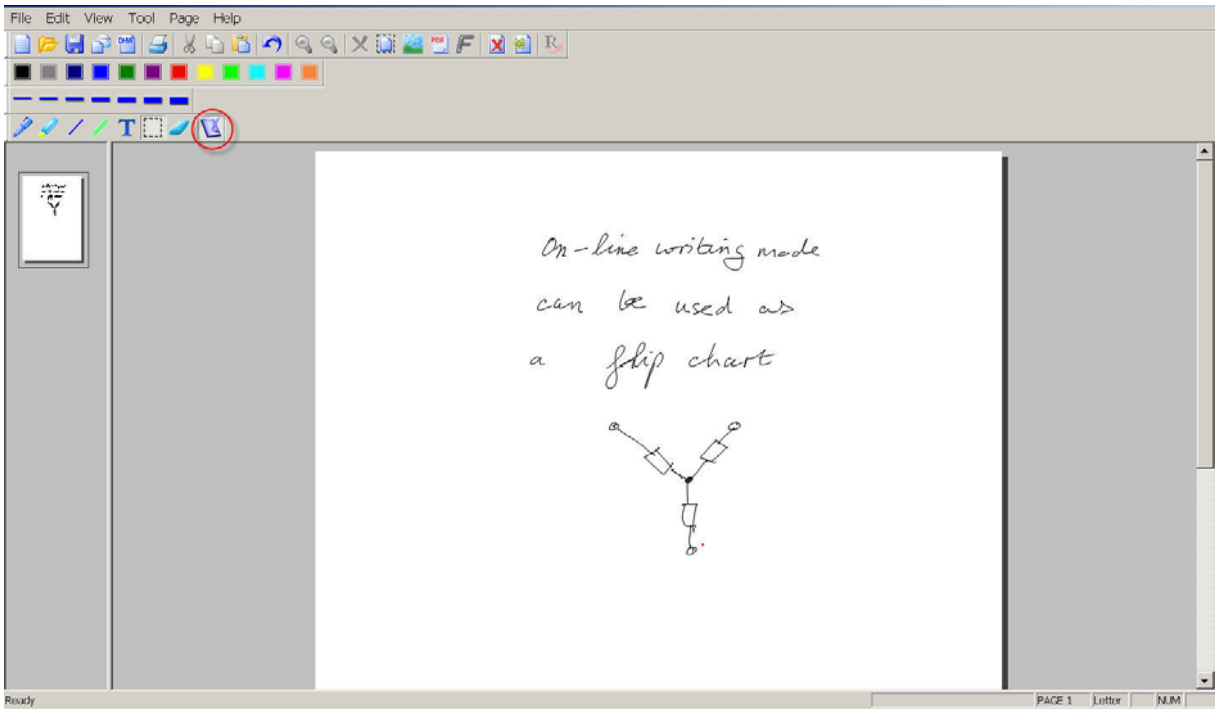

Figure A6 — On-line (flip chart) writing mode

Multiple new pages can be added and the set saved as a PDF file at the end of the session. Backgrounds and clip art can be added if needed e.g. a PES logo.

Annex B
Further reading

The British Educational Communications and Technology Agency, BECTA (URL: www.becta.org.uk) has published the following studies, advice and reference works:

- Tablet PCs in schools
- Getting the most from your interactive whiteboard
- Emerging Technologies for Learning Volume 3 (see Interactive displays and next-generation interfaces chapter: Interactive paper).